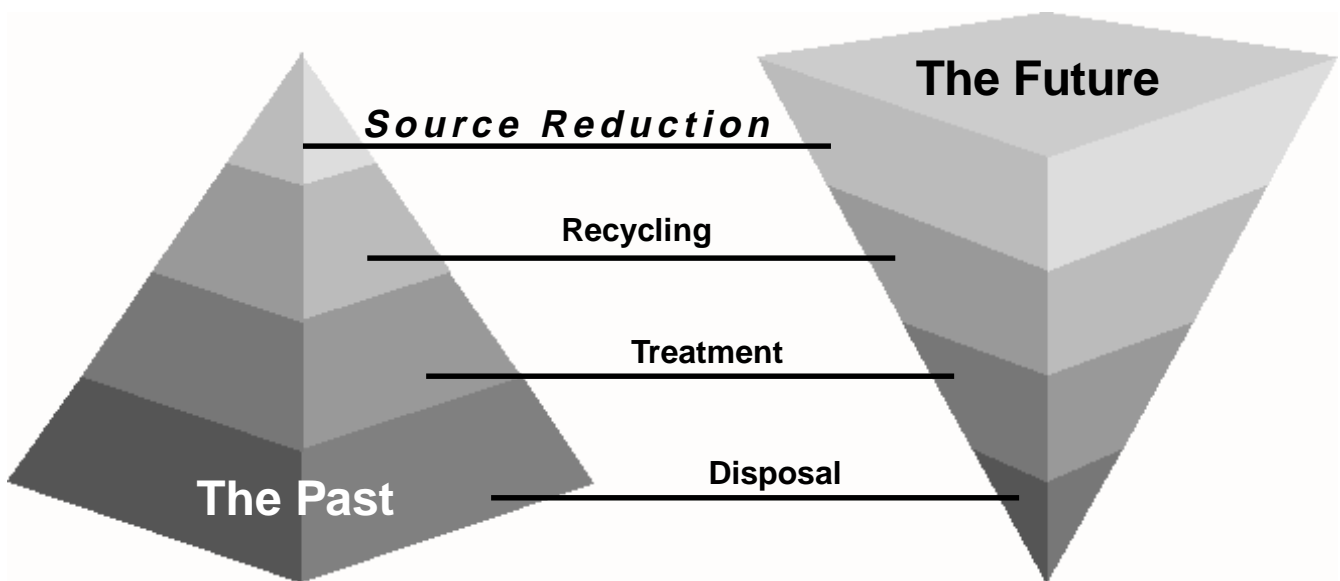


Biennial Report to the Legislature on:

Pollution Prevention Planning



Vermont Agency of Natural Resources
Department of Environmental Conservation
January, 2000

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Pollution Prevention Planning

Background

In July 1993, 221 Vermont businesses developed their initial Pollution Prevention Plans as required for companies that generate more than 2,640 pounds per year of hazardous waste from their routine operations. Plans included identification of all hazardous wastes, an evaluation of pollution prevention opportunities, and an implementation schedule for those opportunities determined to be technically and economically feasible.

Plans must be updated every three years, in part to account for changing circumstances that might affect the feasibility of pollution prevention measures. Thus, Plans were updated in July, 1996 and then again in July, 1999. Also in 1996, manufacturers that use more than 1,000 pounds per year of certain toxic substances were required to develop a Plan for the first time. "Large user" plans are also updated in July of every third year, and where a company is both a generator and a large user, a single Plan addressing both aspects is prepared.

In administering the planning requirement, the Environmental Assistance Division emphasizes two key concepts. First, that companies give priority to source reduction opportunities in their Plans. In other words, projects resulting in the reduction or elimination of a toxic or hazardous wastestream *before* it is used or generated are given preference over recycling or treatment alternatives. Second, that the implementation of any strategy should not result in the transfer of pollutants from one media to another, for example, installing equipment that eliminates a waste that is hazardous at the expense of increasing a wastewater discharge. When these pollution prevention concepts can be successfully applied, companies are often able to achieve both lesser regulatory oversight and lower costs.

Figure 1 shows the number of facilities subject to the planning requirement from 1992 through 1998. Up until 1995, the "Total" is made up of the number of Class A generators of hazardous waste (>26,400 pounds/yr) plus the number of Class B generators (>2,640 pounds/yr). Beginning in 1996, facilities that are "Large Users of toxic substances" (> 1,000 pounds/yr. of a listed toxic) were required to plan. Because the majority of facilities that are "Large Users" are also generators of hazardous waste (and therefore had already developed that portion of their pollution prevention plan), only those "Large Users" that were new to the planning process in 1996 are reflected in the "total facilities subject to planning" in Figure 1.

Facilities subject to planning requirements in 1998 are found in Table 1 at the end of this report. The breakdown of facilities shown in Figure 1 for 1998 is:

Total Facilities Subject to Planning	126
Class A Generators of Hazardous Waste	35
Class B Generators of Hazardous Waste	80
Large Users of Toxic Substances	49
Large Users that are Also Class A Generators*	24
Large Users that are Also Class B Generators*	14
Exempt Facilities	104

*Not shown in Figure 1

Change in Pollution Prevention Planning Status of Companies Subject to Act 100

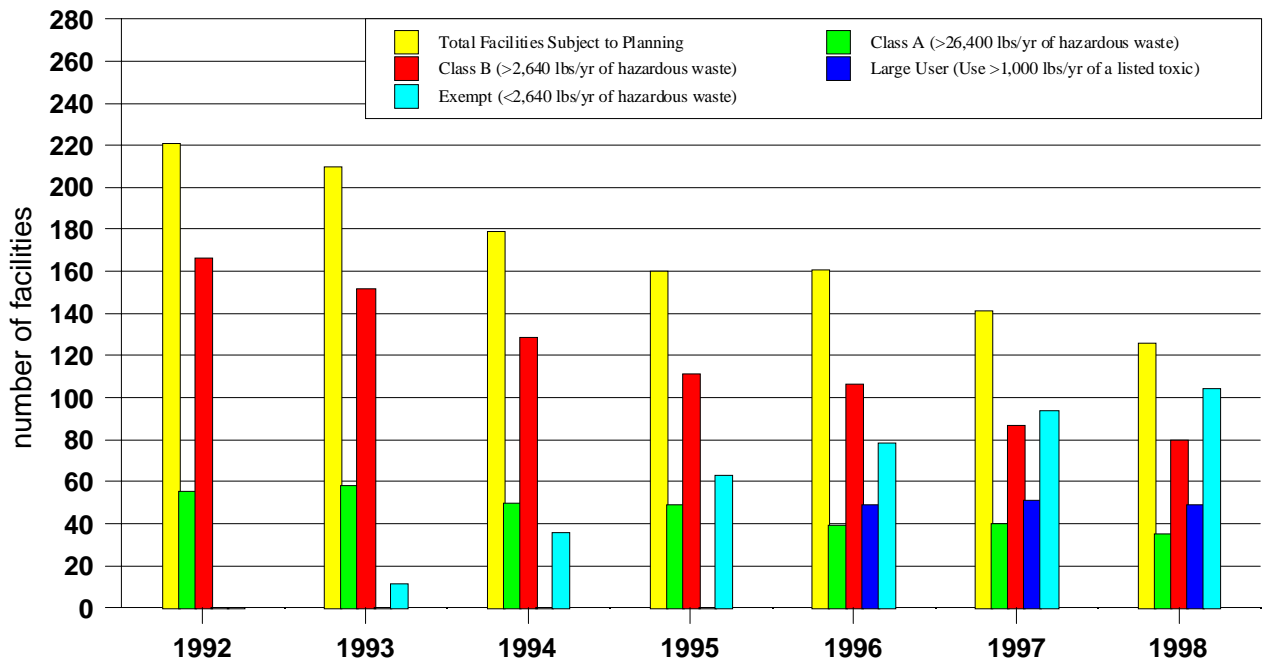


Figure 1.
Source: Pollution Prevention Planning Database

The declining number of facilities subject to planning is explained by the almost parallel decrease in the number of Class B generators of hazardous waste and corresponding increase in exempt facilities. Since 1992, total facilities has decreased from 221 to 126, Class B generators of hazardous waste from 166 facilities to 80, and the number of facilities exempt from planning has risen to 104 by 1998. For facilities that are within striking distance of the 2,640 pound per year threshold, incentives to achieve “exempt” status not only include relief from pollution prevention planning requirements and fees, but also relief from many of the generator requirements in the Vermont Hazardous Waste Management Regulations. Of course, if companies are unable to remain below the threshold in subsequent years, they once again become subject. In addition to these regulatory incentives to generate less hazardous waste, other prominent reasons explaining this trend include changes in the regulations affecting the definition of hazardous waste and the emphasis by business in general at continually improving the efficiency of their operations to cut costs. Many of these initiatives have inherent pollution prevention benefits.

Figure 2 illustrates gross hazardous waste generation totals in Vermont from 1991 through 1998. The data used is taken from the Hazardous Waste Manifest Database which tracks the disposal of all hazardous waste, regardless of how it was generated and who generated it. Therefore, information is included for non-businesses, for one-time “house-cleaning” events, for debris from environmental spills, from site cleanups and many other non-routine events that are not subject to the planning requirement. Nonetheless, it is pertinent information on hazardous waste generation for which reliable records are kept. It is important to note that total generation remained just below 17 million pounds in 1997 and 1998 despite the generally strong economy. Since the planning law became

effective in 1992, there has been a 38% reduction in the total amount of hazardous waste generated through the end of 1998. For the 126 facilities subject to planning in 1998, hazardous waste generation totaled 7.7 million pounds, or about 45% of the total hazardous waste manifested statewide.

Progress in Industrial Pollution Prevention

Companies required to develop a Plan by July, 1999 are shown in Table 1 at the end of this report. Also shown for each facility is planning status (generator, large user or both), and whether the "Plan Summary" was submitted as required. Over half of the facilities opted to retain their Plans on-site. All facilities are required to submit an Annual Progress Report and fee by March 31 which is intended to note any progress made towards the achievement of reduction goals established in the Plan.

**Annual Hazardous Waste Shipments in Vermont
All Generators**

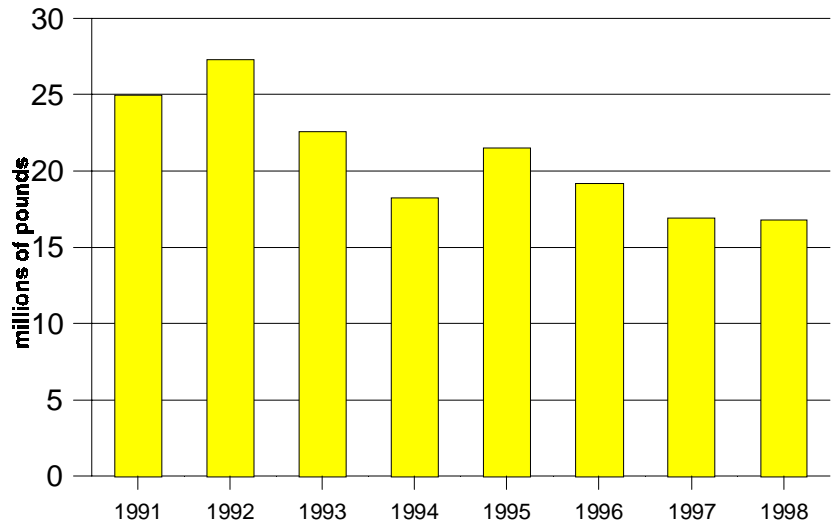


Figure 2.
Source: VT Hazardous Waste Manifest Database

Where facilities reported a reduction for any hazardous wastestream or toxic substance, **Figure 3** indicates the total reduction for all facilities from one year to the next *and* the amount of that reduction attributable to the implementation of one or more pollution prevention measures. It is encouraging to see just how much of the reduction that is reported on Annual Progress Reports is seen by companies as the result of pollution prevention strategies.

**Hazardous Waste Reduction Progress
by Pollution Prevention Planners**

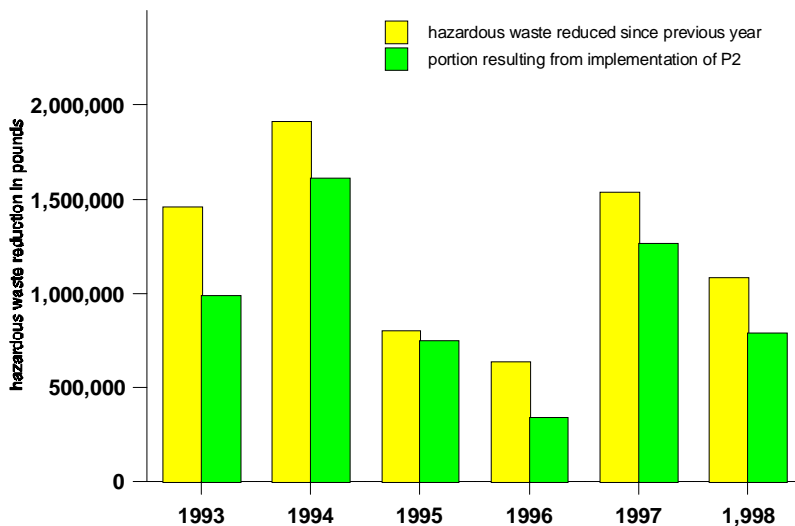


Figure 3.
Source: Pollution Prevention Planning Database

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The variation in total hazardous waste reduced from one year to the next is probably best explained by the fact that a major initiative implemented by a very large manufacturer can significantly alter the data from one year to the next. Thus, three companies accounted for almost 1,000,000 pounds of hazardous waste reduction in 1997.

Pollution prevention strategies are ranked by frequency of selection as reported by companies on Annual Progress Reports - 1993 - 1998.

P2 Strategies	Approximate Frequency of Selection	Example
Improved Operation & Maintenance	42%	Drip pans instead of absorbents at vehicle service facility
Raw Material Substitution	18%	Water-borne coatings instead of solvent-borne at wood products manufacturer
Process Change	14%	Eliminate painting to fabricate product out of stainless steel
In-process recycling	12%	Remove tramp oil and filter metalworking fluids to reuse in machining operations
Equipment Upgrade	12%	Install controls to meter precise amount of adhesive in laminating process
Product Reformulation	2%	Manufacture roller wash, used to clean printing presses, without 1,2,4 tri-methylbenzene as a constituent

Large Users of Toxic Substances

A 'large user' is any manufacturer, SIC 20-39 with 10 or more employees, using more than 1,000 pounds of a SARA 313 chemical during the year. Information for facilities that are large users was first collected in 1995 (baseline). The number of large users has not varied much, from a high of 51 facilities in 1997 to a low of 49 facilities in 1995 and 1998. In 1998, there were 11 large users that were neither Class A (24) nor Class B (14) generators of hazardous waste.

Companies may report toxics use by one of two methods. The "chemical approach" yields the total amount of a specific chemical for all products used at the facility which contain that chemical. For example, a company may use eight different products all containing "xylene" as a constituent. Using the chemical approach, opportunities to reduce xylene usage would be assessed for all of those products. The "product approach" looks at the concentration of toxic substances in individual products. Using this approach, the greater the concentration of toxics in a particular product, the less the company will have to use of that product before exceeding the planning threshold. Opportunity assessment is thus focused on a single area (or product) rather than on a chemical which might be found in relatively low concentrations in several products. One disadvantage of the product approach

**Annual Toxics Use in Vermont
All Large Users**

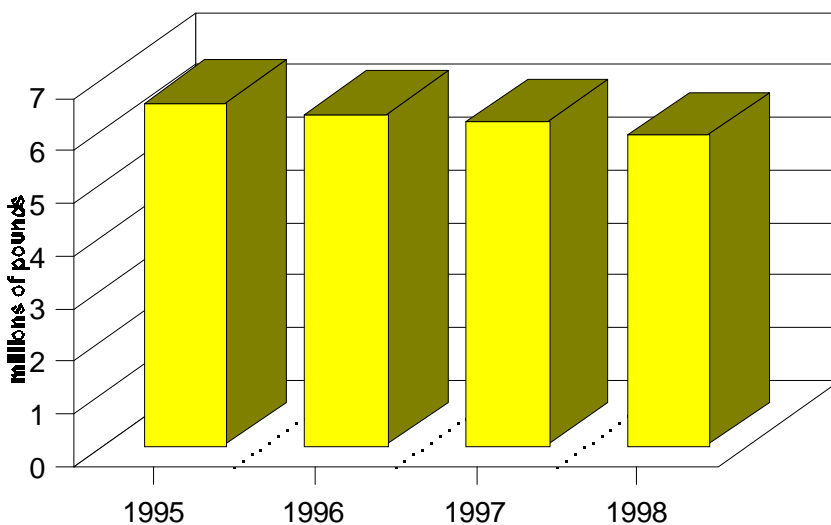


Figure 4.

Source: Pollution Prevention Planning Database

is that it does not allow the Department to report total toxics use by chemical for companies reporting as Large Users.

As with Class A and Class B Generators, Large Users must file an Annual Progress Report and pay an annual fee. **Figure 4** shows the total toxics use for all facilities, 1995-1998. There has been a gradual reduction from one year to the next, equal to 9 % for the period.

Toxics Release Inventory

Another good source of toxics use information is the Toxics Release Inventory (TRI) administered by the U.S. Environmental Protection Agency (EPA). Like Vermont's "large user" definition, TRI affects manufacturers using SARA 313 chemicals. The threshold quantity for reporting however increases to 10,000 pound per year. Under TRI, 37 Vermont facilities reported to the EPA in 1999 for chemicals used in 1998. TRI is simply a reporting requirement on releases of those chemicals to the environment and is not a planning requirement. Unlike other federal or state reporting requirements however, TRI reporting is multi-media; that is, releases to air, water and land must all be reported.

Figure 5 shows an impressive reduction in the release of toxics to the environment since 1988, the first year of TRI reporting. In any given year, over 90% of the reported releases were to the air.

**Vermont Toxics Release Inventory (TRI)
1987 - 1995**

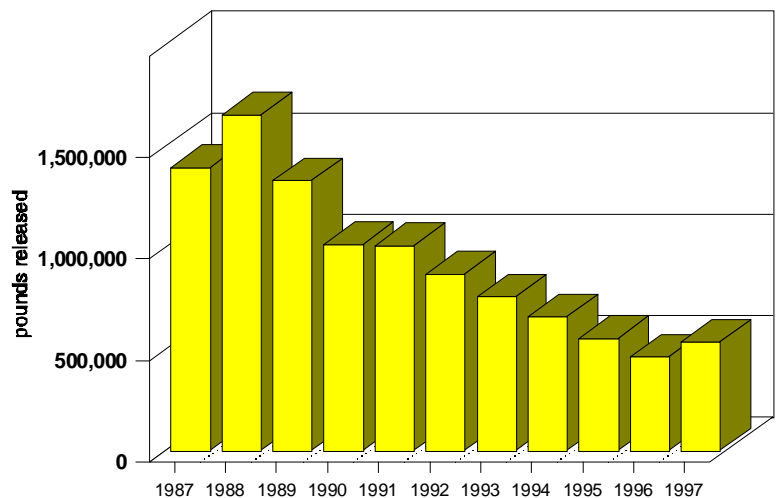


Figure 4.

Source: USEPA, Toxics Release Inventory

Future Issues and Trends in Facility Planning

Most companies have now completed three rounds of facility pollution prevention planning. Many have successfully used the planning process to assess reduction opportunities and provide additional justification for implementation of a project. The emphasis in planning remains clearly focused on hazardous waste reduction. Most companies have implemented the "easier", lower cost opportunities, and further improvements often become increasingly difficult without new technology and capital.

Some companies prefer to take a broader look at the environmental impacts of their operations in the planning process, regardless of whether chemical use results in the generation of a hazardous waste. For these companies, a chemical release may pose an issue for meeting a limit in its wastewater discharge permit or to remain below the "action level" established for a hazardous air contaminant. Not only is pollution prevention planning well-suited to this type of task because of its empha-

sis on the “manufacturing process”, but it illustrates the cross-media aspects of toxics issues that companies must face as a practical matter. Division staff encourage companies to take this approach to planning as a way to make it as relevant as possible.

Still, the Department expects that hazardous waste generation will continue to gradually decline as companies are forced to carefully evaluate how to do things more efficiently to remain competitive. The planning requirement presents one more incentive to systematically consider new ways of doing business.

This drive to improve efficiency has led some companies to develop comprehensive Environmental Management Systems (EMS) as an important piece of overall management strategy. An EMS may be defined as “the organizational structure, responsibilities, practices, processes and resources for implementing and maintaining environmental management”. ISO 14000 establishes an international standard for large companies to develop an EMS. The Department’s Environmental Assistance Division has worked to develop a relevant system for smaller businesses typical of Vermont. Pollution prevention can and should be a part of a company’s EMS. Therefore, facilities were given the option of incorporating pollution prevention in an approved EMS in lieu of updating their Plan for July 1, 1999. Three facilities chose to do this (see Table - Facilities Subject to Act 100). It is important to integrate the philosophy of pollution prevention as part of any company’s systematic approach to environmental management.

Business Assistance

Staff in the Environmental Assistance Division (EAD) provide direct compliance and pollution prevention technical assistance to businesses primarily through on-site visits, a toll-free hotline, development of sector specific environmental *guides* and workshops.

On-site assistance was provided to about 35 businesses in 1998. Such visits may be at the company’s request or they may be initiated by staff in order to review a pollution prevention plan that is maintained at the facility. On-site assistance also occurs as a result of referrals made by other Department programs. On-site assistance is not limited to facilities subject to planning requirements. Regardless, site visits often result in suggestions to the company for a pollution prevention measure(s). Companies typically have issues or questions regarding environmental regulations, usually related to some aspect of the facility’s compliance status. There are many examples of on-site visits that have helped lead to the implementation of a pollution prevention alternative.

EAD also maintains a toll-free hotline that businesses (and others) may use to get answers to their environmental compliance and pollution prevention questions. Businesses may ask their questions anonymously. Some calls received on the hotline may lead to extensive assistance in the form of an on-site visit while many are simply re-directions to the appropriate Department program for follow-up. The hotline is located in the offices of three senior technical assistance staff who, as a group, handle literally hundreds of calls each year.

To-date, assistance staff have produced three sector specific environmental guides - “A Printer’s Guide to Vermont’s Environmental Regulations”, “A Vehicle Service & Repair Technician’s Guide to Vermont’s Environmental Regulations”, and “A First place Finish - An Environmental Guide for Vermont Wood Finishers”. The concept for all three has been to develop a concise, self-audit checklist

on compliance issues most likely to affect small businesses in the chosen sector. The Guides contain many useful pollution prevention tips and best management practices. The Guides also use single page *Fact Sheets* to provide additional information on issues too involved to be effectively addressed in an audit checklist, issues like Used Oil Burning or Oil-Contaminated Absorbents. The target audience for these publications are the small businesses that typically do not need DEC permits to operate and may only be minimally subject to other regulatory requirements but are in need of a more basic understanding of their environmental responsibilities under the law and how to navigate the system. All of the guides have been well received by businesses. Distribution is by direct mail followed up by workshops.

During the fall of 1997, EAD staff held thirteen workshops around the state to explain and promote the use of the Guide for Vehicle Service and Repair Technicians. Over 150 persons, mostly from small garages and dealerships, attended. In spring 1998, EAD joined with the Vermont League of Cities and Towns and the U.S. EPA to do an additional eight workshops, this time directed at municipal garages, to provide information on environmental and worker health and safety issues. The Guide again served as a focal point for the workshops as 83 town and state employees attended. Evaluation forms completed by attendees were highly supportive of the workshops as an effective way to disseminate information, get questions answered and introduce the Guide.

Appendix